

AD-A172 298

ALKALI ATOM - TETRAHALOETHYLENE CHEMILUMINESCENT
REACTIONS(U) NEW HAMPSHIRE UNIV DURHAM DEPT OF PHYSICS
J J WRIGHT 22 SEP 86 N00014-83-K-0533

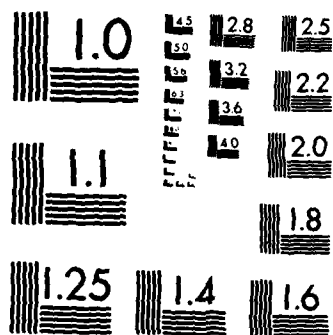
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Final Report

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Alkali Atom - Tetrahaloethylene Chemiluminescent Reactions

Task No. NR 051-847

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John J. Wright, Principal Investigator

Physics Department
University of New Hampshire
Durham, NH 03824

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July 1983 - August 1986, \$87,093

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↙ The object of this research project was to investigate new vapor phase chemiluminescent reactions between alkali atoms and halide molecules in order to discover promising candidates for short-wavelength chemical lasers. Many reactions were studied and several of these were found to produce visible emission from electronically excited molecules. Five of these reactions produced molecules that had either vibrationally inverted populations in the excited state or had transitions to high lying vibrational levels of the ground state, making them potential chemical laser candidates. These results have been reported in technical reports and in the publications listed below. Previous end of the year reports discuss several reactions which were studied but were not of sufficient interest to warrant publication.

Personnel:

J.J. Wright, Principal Investigator

L.C. Balling, Faculty Associate

K..K. Lin, Graduate Student

Publications:

- 1) **Alkali-SCl₂ Chemiluminescence: Vibrational Population Inversion in the B state of S₂**, J.J. Wright and L.C. Balling, Chem. Phys. Letters 108, 214 (1984)
 - 2) **NaK Chemiluminescence**, J.J. Wright and L.C. Balling, Chem. Phys. Letters 112, 117 (1984)
- 2 -

- 3) Alkali Atom - SbCl_5 Reactions: Blue-Green Chemiluminescence from an Inverted Population in SbCl_5 , J.J. Wright and L.C. Balling, Chem. Phys. Letters 118, 364 (1985)
- 4) Te_2 Chemiluminescence from Alkali Atom- TeCl_4 Reactions K.K. Lin, L.C. Balling and J.J. Wright, Chem. Phys. Letters 123, 37 (1986)
- Chemiluminescence from Excited C_2^- -Alkali Cation Complexes formed in Alkali Atom - Halocarbon Flames, K.K. Lin, L.C. Balling and J.J. Wright, Submitted to Chem. Phys. Letters
- 6) PS Chemiluminescence from Alkali - PSCl_3 Reactions, K.K. Lin, L.C. Balling and J.J. Wright, To be submitted to Chem. Phys. Letters.

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